

# Environmental Bulletin

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### Message from the CEO

Dear Friends,

2006 is an anniversary year for Athens International Airport as we celebrate five years of airport operation and ten years since the Airport Company's foundation.

The commencement of operations of Athens International Airport in March 2001 heralded a new era in air transportation in Greece. State-of-the-art infrastructure and upgraded services have contributed to the efficient handling of millions of passengers, hundreds of thousands of aircraft and tonnes of cargo.

Since its first year of operation, our airport managed to become one of the best airports in the world, ranking 2nd in Europe and 3rd in the world among airports with up to 15 million passengers annually, according to the Global Airport Monitoring Programme of the International Air Transport Association (IATA), despite the crisis in the aviation industry from the terrorist attacks of 11th September.

In 2002, we managed to successfully overcome the negative effects of the war in Iraq and the SARS epidemic and ranked 1st among all airports in Europe in passenger satisfaction for the services provided.

In 2003, in recognition of its contribution to the aviation industry and its supportive measures to airlines, Athens International Airport was honoured with the 2003 Eagle Award by the International Air Transport Association (IATA).

2004 brought about the challenge of hosting the Olympic and Paralympic Games in Athens, one of the most important events globally, not only as the paramount athletic event but also as a symbol of world peace. We managed to operate with total safety, providing excellent services as

the most hospitable welcoming point for the Olympic Family as well as millions of visitors.

By the end of 2005, our airport achieved a historic record. For the first time we exceeded the threshold of 14 million passengers, an increase of 4.5% compared to the "Olympic" year 2004.

In addition, 2005 was a year of international awards for Athens International Airport. Having gained for the fourth consecutive year the passengers' recognition for the provision of excellent services, ranking 2nd in the world (AETRA Award), our airport won the "OAG Airport Marketing Award 2005" as the best airport in the world in its category (10-25 million passengers), owing to our programme for supporting airlines, and our contribution to the development of new routes.

During the first five years of operation we faced significant challenges and managed to address them successfully.

Congratulations to all the members of the Airport Community for five years full of success, and my personal wishes for many more successful years!

**Alfred A. van der Meer**

**Message from the Environmental Services Department**

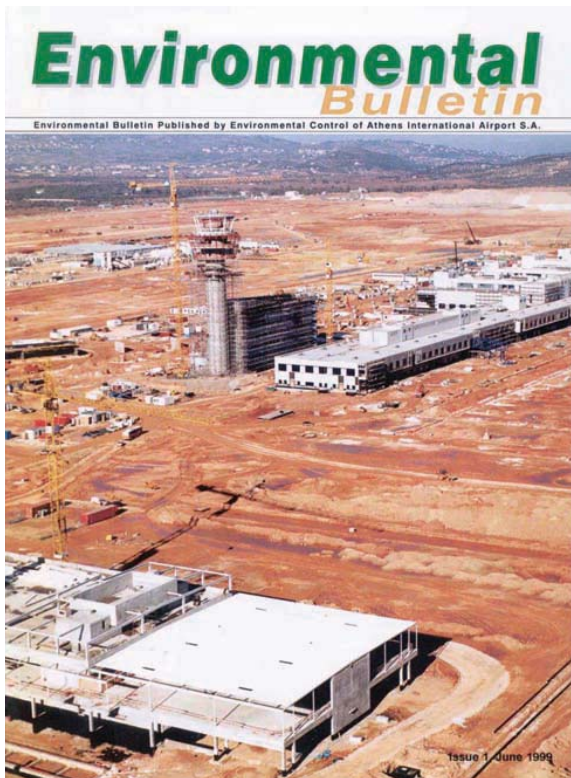
Dear Readers,

This year, the Environmental Services Department counts ten years of operation...

Ten creative years that started with the establishment of the Department, in June 1996, and the first environmental report that was submitted to the Ministry of the Environment the same year.

We continued in 1997 with the completion of management studies, as well as performing measurements, recording the current situation, and supervising the construction works from an environmental point of view. At the same time, we made the first major donation of ten cleaning machines to the Municipalities of Mesogeia.

1998 was marked by the installation of the first monitoring network (the Air Quality Monitoring Network with six monitoring stations). We also started the ground water monitoring programme, completed the transfer of the church of the Holy Apostles Peter and Paul beyond the airport's premises, and established the archaeological laboratory.



In 1999, we published our first Environmental Bulletin, a six-page leaflet that described in brief our environmental activities and our commitment to the protection of the environment.

Before the commencement of operations, and more specifically in February 2000, we established the Airport Company's environmental policy that reflects our commitment to the protection of the environment, and commenced the implementation of the Environmental Management System (EMS). In December of the same year, the EMS was certified according to the international environmental standard EN ISO 14001. Moreover, in 2000 we completed the aircraft noise study and began the installation of the Noise Monitoring System (NOMOS).

And then came 2001, the year the airport commenced its operation...

Many things have changed for us... For the first time, we saw the actual recording of noise levels and the correlation with aircraft flights; we saw the results of the implementation of the Noise Abatement Procedures; we used a sound system in order to disperse birds from the airport site; we started the surface water monitoring programme; we recycled the first quantities of recyclable materials, and handed over a park to the Municipality of Markopoulo.

In 2002, we provided, for the first time, financial incentives in order to encourage recycling, and started the electronic waste recycling programme; we conducted a study comparing air quality in the greater Mesogeia area before and after the airport began operating; and with the initiative of the Hellenic Civil Aviation Authority, additional measures for the reduction of noise annoyance in the area of Artemis were implemented.

In 2003, we handed over parks to the Municipalities of Glyka Nera and Pallini; completed the Museum and the Environmental Information Centre in the Main Terminal Building; launched the Environmental Scholarship programme and the Environmental Awareness programme at local schools. This was also the year we were awarded our first distinction: a 'Commendation' in the culture category, in the context of the Corporate Responsibility Excellence Awards.

2004 was marked not only by the Olympic Games but also by a number of distinctions. We became the first





Hellenic company to receive the European Commission's GreenLight Award for the implementation of a series of energy efficient measures in lighting, thus reducing emissions related to the greenhouse effect. We also completed the installation of a modern Sound Radar for monitoring meteorological parameters; we conducted a study for the evaluation of the ground water monitoring programmes; implemented new recycling programmes doubling the quantities of recyclable materials; and published a special brochure regarding the cultural heritage of the area in which the airport is located.

By the end of 2005, we managed to achieve several important environmental targets. We adjusted the Environmental Management System according to the requirements of the new edition of the international standard ISO 14001:2004. We installed a Differential Optical Absorption Spectroscopy (DOAS) system, which is an advanced air quality monitoring system, and began our efforts to upgrade the noise monitoring system. We started co-operating with all the Alternative Management

Systems, and implemented a recycling programme for the schools in the Municipality of Artemis. In co-operation with the University of Patras, we started a flora, fauna and habitat-monitoring programme in the vicinity of the airport. Finally, our airport was honoured in 2005 with an "Aerospace Industry Award" in the "Infrastructure and Environment" category for its efficient operation during the Olympic Games in the fields of organisation of operations, infrastructure, passenger and airline services and environmental protection.

**During the last ten years a lot of things have changed... but the one thing that remains unchanged is our commitment to managing all the environmental aspects of airport operations responsibly, based on the principles of sustainable development and continual improvement.**

**The Environmental Services Department Team**

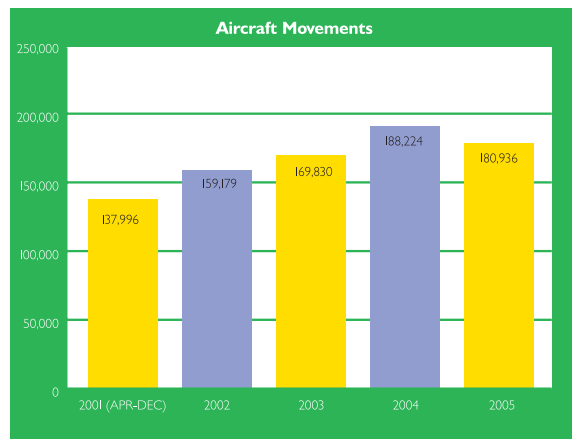
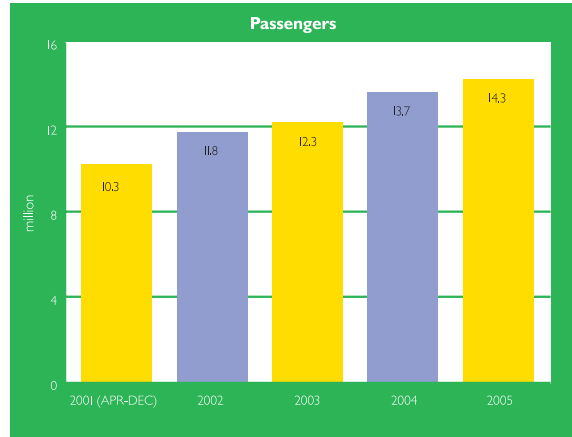


## KEY FIGURES

Athens International Airport “Eleftherios Venizelos” is located 33km northeast of Athens, in the Mesogeia area. It covers an area of approximately 17km<sup>2</sup>, has two independent runways approximately 4,000 meters each, one main terminal building, one satellite terminal building and 89 aircraft stands.

During 2005, 61 airlines offered travellers a choice of 71 international and 32 domestic destinations with scheduled flights, while charter passenger carriers connected Athens with 139 international destinations. The airport's cargo network consists of 8 domestic and 10 international destinations towards the hub airports of cargo companies, through which cargo was forwarded all over the world. Finally, charter cargo flights connected Athens with 40 more destinations.

The total number of passengers in 2005 was 14.3 million, an increase of 4.5% compared to 2004. The number of aircraft movements decreased by 5.3% to 181 thousand movements. Total cargo handled through AIA in 2005 reached 116 thousand tonnes, a decrease of 2.6% compared to 2004.





# ENVIRONMENTAL MANAGEMENT SYSTEM

The Environmental Management System (EMS) sets up the framework for the operation of the Airport Company and the achievement of the annual environmental targets, in order to ensure the continuous provision of high-level environmental services at the airport.

### ISO 14001 Certification

Athens International Airport "Eleftherios Venizelos" is the only Hellenic airport with an Environmental Services Department certified according to EN ISO 14001 (as of December 2000).



Having evaluated the proposed changes in the new edition of the standard (EN ISO 14001:2004), the Environmental Services Department adopted the required changes in 2005. Meanwhile, the department's Environmental Commitment was updated in order to be in accordance with the requirements of the new edition of the standard. The annual audit of the Environmental Management

System, according to the new edition of the standard, was conducted successfully in December 2005 by the certification body DQS Hellas (Deutsche Gesellschaft zur Zertifizierung von Managementsystemen mbH).



### Environmental Plan

The annual Environmental Plan describes in brief the management programmes and the activities of the Environmental Services Department.

The 2005 Environmental Plan consisted of 15 programmes with their relevant targets that should be achieved in a specific time frame. The respective performance report is presented in the following table. The Environmental Plan for 2006 comprises 11 programmes and their relevant targets, which the Environmental Services Department aims to achieve.

The progress of these programmes is continuously monitored through environmental indicators and measured parameters set up for this purpose. Continual improvement is accomplished through the achievement of these targets, the assessment of the achievements and the development of new targets.

## 2005 ENVIRONMENTAL PLAN Performance Report

PROGRAMME TITLE	OBJECTIVE	TARGET	RESULTS
Implementation of a radar interface with the noise monitoring system (NOMOS)	Monitor noise abatement procedures	Integration of radar data in the noise monitoring system	<b>IN PROGRESS</b>
Assessment of the air quality at the threshold of airport runways	Monitor air quality on airport site	Perform air quality measurements with the mobile station on both airport runways for at least one year	<b>ACHIEVED</b>
Aircraft emissions inventory	Monitor aircraft emissions of atmospheric pollutants	Semi-automated monitoring and reporting of current and past aircraft emissions at AIA	<b>IN PROGRESS</b>
Evaluation of linearity of air quality monitoring network (AQMN) ozone analysers	Evaluate level of measurement confidence in air quality monitoring network equipment	Test performance of ozone analysers with certified ozone generator	<b>ACHIEVED</b>
Recycling on airport site	Minimise waste disposal to landfill	Achieve a recycling rate of 12% on airport site	<b>ACHIEVED</b>
Environmental awareness	Raise environmental awareness of Athens International Airport's personnel	72% of Athens International Airport's employees to obtain environmental awareness training	<b>ACHIEVED (75.9%)</b>
Environmental awareness & waste management to Third Parties	Train State Authorities on environmental issues, including waste management	Provide at minimum one seminar to key personnel of eight (8) State Authorities	<b>ACHIEVED</b>
Enhancement of our partners' awareness of the Environmental Management System	Raise awareness of our partners' personnel regarding the Environmental Management System	Communicate the Environmental Management System's requirements to 100% of our partners	<b>ACHIEVED</b>
Community projects – Environmental awareness	Raise environmental awareness in the greater Mesogeia area	Provide environmental awareness training to the students of the first grade of at least ten (10) secondary schools in the Mesogeia area	<b>PARTIALLY ACHIEVED</b>
Community projects – Construction of urban green areas	Create urban green areas in the Municipalities in the Mesogeia area	Creation and handover of 3 Parks in the Municipalities of Koropi, Spata and Artemis	<b>IN PROGRESS</b>
Bio-monitoring programme Phase II	Perform 1st Survey of Phase II, recording the status of the ecosystems defined in Phase I	Record deviations from the baseline survey	<b>IN PROGRESS</b>
Revision of bird control & reduction programme	Implement the results of the audit performed in October 2003	Improve effectiveness of bird hazard control and reduction programme, minimise bird strike risks and upgrade documentation procedures	<b>ACHIEVED</b>
Reduction of phosphorus and nitrogen concentrations in airport's main Sewage Treatment Plant (STP) effluent	Improve wastewater quality in respect to the Ratifying Law (Law 2338/1995) limits	Reduce phosphorus and nitrogen concentration by 73% and 80% respectively compared to 2004 average year values	<b>IN PROGRESS</b>
Automation of resources monitoring	Continuous monitoring of resources consumption (energy, water, fuel) and relative contribution to greenhouse effect	100% fully automated resources monitoring	<b>PARTIALLY ACHIEVED</b>
Airport site emissions inventory	Monitor emissions of atmospheric pollutants generated on airport site	100% semi-automated monitoring and reporting of airport operation emissions on airport site	<b>IN PROGRESS</b>





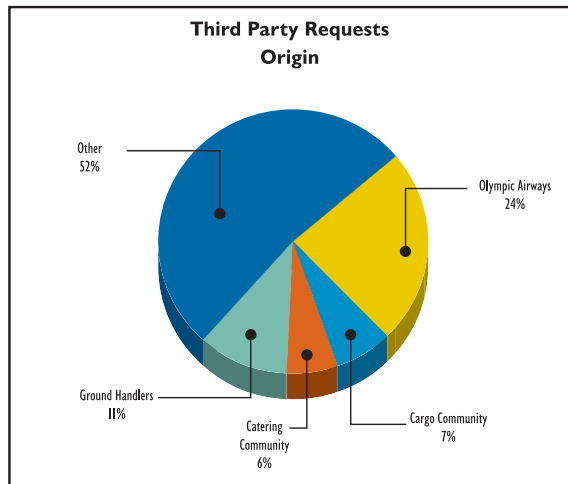
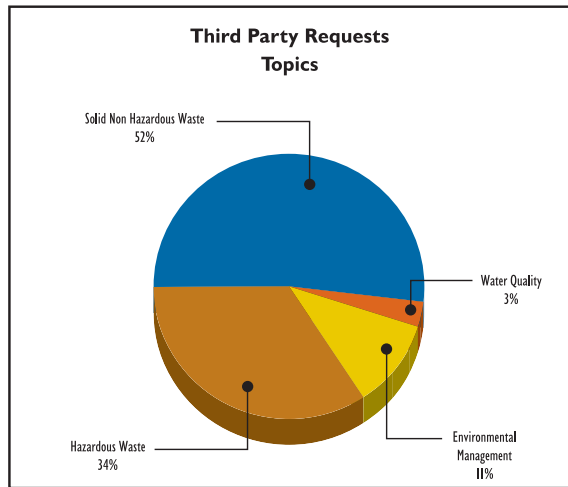
## 2006 ENVIRONMENTAL PLAN Objectives and Targets

PROGRAMME TITLE	OBJECTIVE	TARGET
Implementation of a radar interface with the noise monitoring system (NOMOS)	Monitor noise abatement procedures	Integration of radar data in the noise monitoring system
Recycling on airport site	Minimise waste disposal to landfill	Achieve a recycling rate of 20% on airport site by 2008
Evaluation of the quality of the air quality monitoring network (AQMN) measurements	Evaluation of the quality of measurements collected by the AQMN	Assess the uncertainty of the time average air quality measurements of NOx, O <sub>3</sub> , SO <sub>2</sub> , CO, and HCs analysers
Environmental awareness	Raise environmental awareness of Athens International Airport's personnel	82% of Athens International Airport's employees to obtain environmental awareness training
Aircraft emissions inventory	Monitor aircraft emissions of atmospheric pollutants	Semi-automated monitoring and reporting of current and past aircraft emissions at AIA
Airport site emissions inventory	Monitor emissions of atmospheric pollutants generated on airport site	100% semi-automated monitoring and reporting of airport operation emissions on airport site
Recycling programme at the schools of the Municipality of Artemis	Raise environmental awareness in the greater Mesogeia area / Minimise waste disposal at landfill	Collect a minimum of 10 tonnes of recyclable paper & aluminium cans from the schools in Artemis Municipality
Community projects – Construction of urban green areas	Create urban green areas in the Municipalities in the Mesogeia area	Creation and handover of 3 parks in the Municipalities of Koropi, Spata and Artemis
Bio-monitoring programme Phase II	Perform 1st Survey of Phase II, recording the status of the ecosystems defined in Phase I	Record the existing status of fauna, flora and vegetation in order to define possible deviations from baseline
Reduction of phosphorus and nitrogen concentrations in the airport's main Sewage Treatment Plant (STP) effluent	Improve wastewater quality in respect to the Ratifying Law (Law 2338/1995) limits	Reduce phosphorus and nitrogen concentration by 73% and 80% respectively compared to 2004 average year values
Internal assessment of services of the Environmental Services Department	Assess internally the quality of services of the Environmental Services Department	Undertake a survey of selected AIA departments

## The Airport's Third Parties

### Third Party Requests

During 2005 the Environmental Services Department received 289 requests regarding solid non hazardous waste management (52%), hazardous waste management (34%), environmental management (11%) and water quality (3%). The requests were received by the following Third Parties: Olympic Airways (24%), cargo community (7%), catering community (6%), ground handlers (11%), and other Third Parties (52%).



Third Party requests have been recorded and analysed since 2002. Since then there is a constant increase of requests, which can be attributed to a better understanding of the environmental issues, a raised environmental awareness and an increased number of

Third Parties. The average response time for all requests was two (2) days.

In the context of the regular evaluation of the provided environmental services, the Environmental Services Department conducted a survey through a questionnaire in order to assess the quality of services provided by the department and the waste management contractor, as well as evaluate the Third Parties' environmental needs. According to the survey results, 90% of the responders either "totally agree" (69%) or "agree" (21%) that the co-operation with the Environmental Services Department is satisfactory; 76% "totally agree" that the representatives of the department are very willing to help; and 63% "totally agree" that the information provided by the Environmental Services Department on waste management issues meets their expectations. In general, the most important suggestions on waste management services are the following:

- More frequent collection of waste.
- Reduction of waste management prices.
- Better maintenance and cleaning of waste management equipment.
- More initiatives to promote recycling.

All the above suggestions are taken into account in the context of Athens International Airport's waste management policy.

### Environmental Training

Environmental Awareness and Waste Management training continues with great interest. During 2004, the Environmental Services Department conducted twelve (12) seminars to airport Third Parties, eight (8) of which were addressed to State Authorities (National Telecommunications Organisation, Hellenic Civil Aviation Authority, Customs etc).

### Environmental Auditing

During 2005, sixty (60) environmental audits were performed to the airport's Third Parties. The main environmental challenges are related to waste management (recyclable





and hazardous waste) and environmental documentation (submission of environmental reports and data, revision of environmental plans).

Additionally, daily site inspections performed by specialised personnel of the Environmental Services Department are in progress.

**Meetings with Third Parties**

Six (6) regular meetings with the major ground handlers, catering companies & ground handlers performing

ground support equipment maintenance activities, were conducted during 2005 in order to discuss current and future environmental issues.

**Airport Exercises**

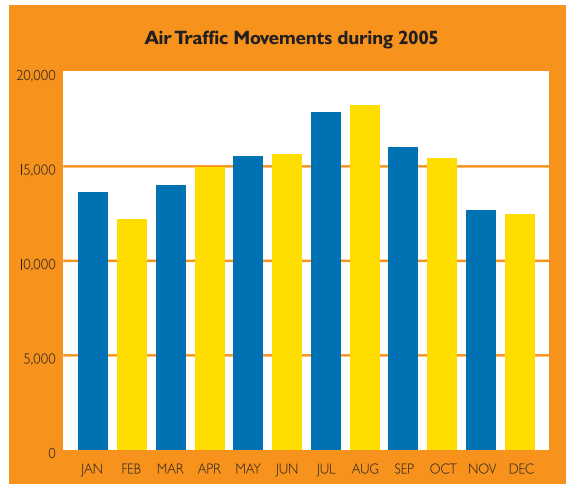
During 2005, the Environmental Services Department participated as an observer in three exercises related to fire safety; a virtual accident involving an aircraft loaded with radioactive materials; and aircraft de-icing procedures by the Hellenic Civil Aviation Authority.



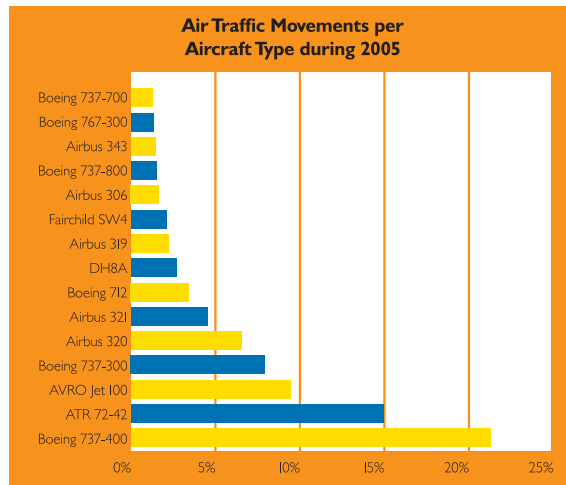
## AIRCRAFT NOISE

### Air Traffic Data

Air traffic movements (arrivals and departures) during 2005 ranged from 12,200 in February to 18,200 in August. The average daily number of movements for this period ranges from 436 in February to 589 in August.



The aircraft types accounting for most of the air traffic movements are: Boeing 737-400, ATR, and AVRO Jet 100, as indicated in the relevant chart.



### Noise Abatement Procedures

The Noise Abatement Procedures (NAPs) were defined in co-operation with the Hellenic Civil Aviation Authority

(HCAA) before airport opening in order to minimise aircraft noise in the residential areas in the vicinity of the airport. The NAPs are procedures for aircraft operation such as runway use or use of reverse thrust, and are published in the AIP (Aeronautical Information Publication), Greece.

The NAPs for runway use comprise the following measures:

- Avoidance of use of runway 03R for takeoffs during the night (23:00-07:00).
- Avoidance of use of runway 21L for landings during the night (23:00-07:00).

### Additional Measures

In order to further reduce aircraft noise, additional measures are being implemented, including the following:

- Departures between 15:00 and 18:00 are mostly realised from runway 03L, in accordance with the relevant guidelines (NOTAM) issued by HCAA. Additionally, during the same time period, landings on runway 21L are generally avoided.

### Results of the Preferential Runway Use as Defined in the NAPs during 2005

Out of the 11,798 night departures with north winds only 956 (8%) took place from runway 03R.

Out of 1,953 night arrivals with south winds only 224 (12%) took place on runway 21L.

Only 10% of the departures between 15:00-18:00 to the north were carried out from runway 03R.

Only 5% of the arrivals to the south between 15:00 and 18:00 were carried out on runway 21L.

- Regular meetings with the representatives of the Air Traffic Control of HCAA are carried out to discuss noise issues. The issues discussed include the enforcement of the NAPs, the results of noise monitoring, and noise complaints etc. During 2005, five (5) meetings were held.





**Noise Monitoring System (NOMOS)**

Athens International Airport S.A. has installed a NOise MONitoring System (NOMOS) for the continuous measurement of noise levels in the vicinity of the airport and the automatic correlation of noise events with aircraft movements. The system comprises ten (10) permanent Noise Monitoring Terminals (NMTs) and one mobile unit.

**Locations of Noise Monitoring Terminals**

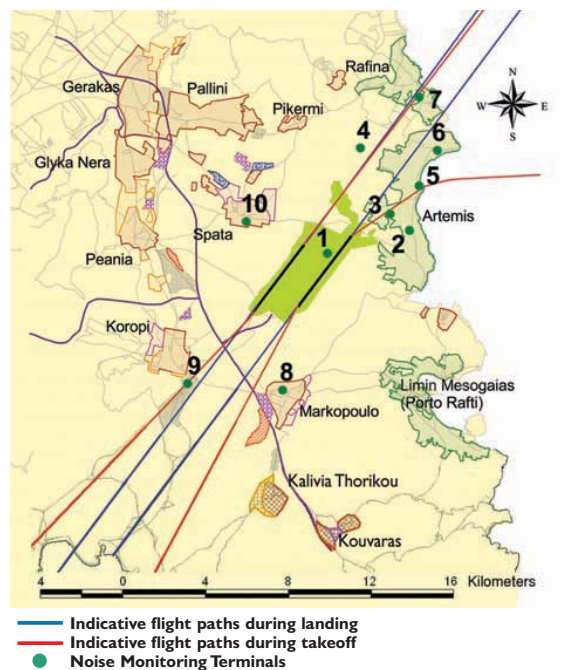
Nine (9) noise monitoring terminals in total are located in the residential areas along the main flight routes and especially in:



- Artemis – 4 terminals (Vorrineza NMT 2, Ag. Ioannis NMT 3, 1st Elementary School of Artemis NMT 5, Ag. Nikolaos NMT 6).
- Ag. Kiriaki – 1 terminal (NMT 4).
- Rafina – 1 terminal (NMT 7).
- Markopoulo – 1 terminal (NMT 8).
- Koropi – 1 terminal (NMT 9).
- Spata – 1 terminal (NMT 10).

Additionally, one terminal (NMT 1) is installed inside the airport to monitor noise from aircraft ground operations.

During the 2005, NMT 3 in Agios Ioannis was removed following a request of the property owner. The works for the reinstallation of the NMT in a new site 300m to the west of the former site are in progress. In order to avoid a gap in measurements, the mobile unit has been installed in this area. NMT 4 is also in the stage of reinstallation for the same reasons.



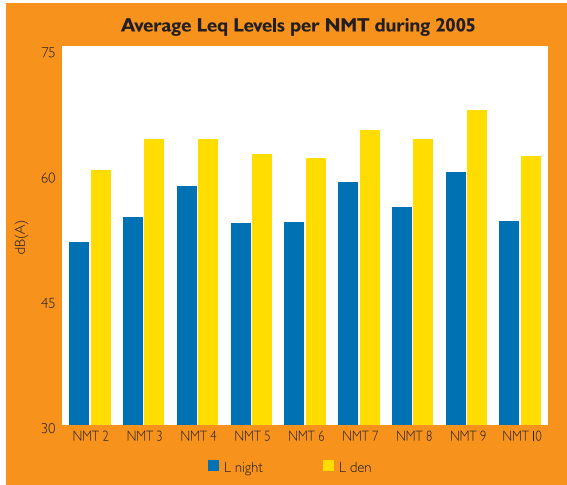
**Radar Interface and Upgrade of NOMOS**

During 2005, the works for the upgrade of the software of the noise monitoring system and the interface with the radar of HCAA commenced.

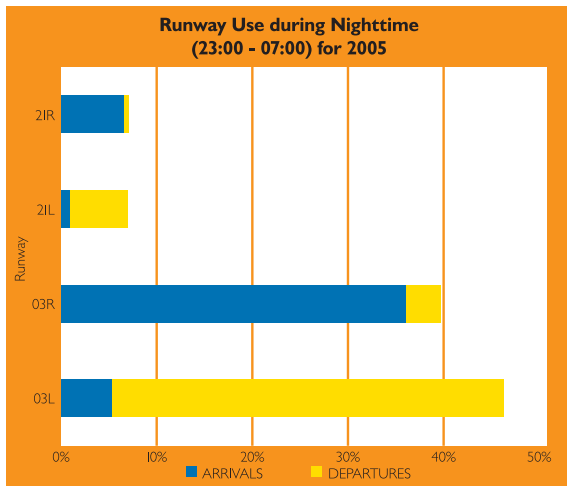
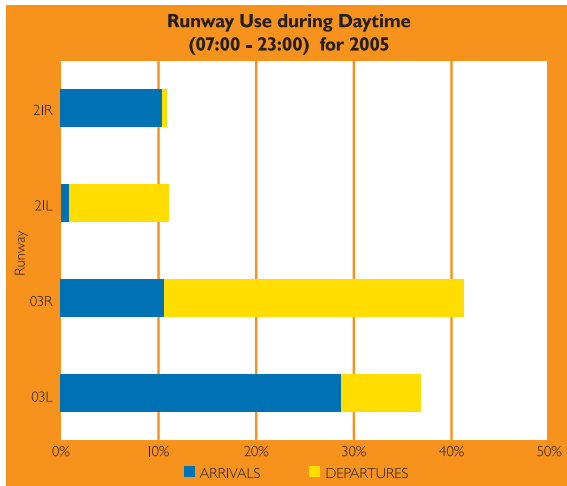
**Noise Climate Indicators**

In this “Environmental Bulletin” the results of noise measurements for 2005 are presented for Lden and Lnight indicators. These indicators represent the total noise levels that include the contribution of all noise sources (e.g. aircraft noise, traffic noise, other environmental noises etc).

It must be noted that for the calculation of the Lden Indicator, an increased evening and night "penalty" (i.e. 5 dB(A) and 10 dB(A) respectively) is added.



Additionally, the results for runway use at day and night are presented in the following charts.

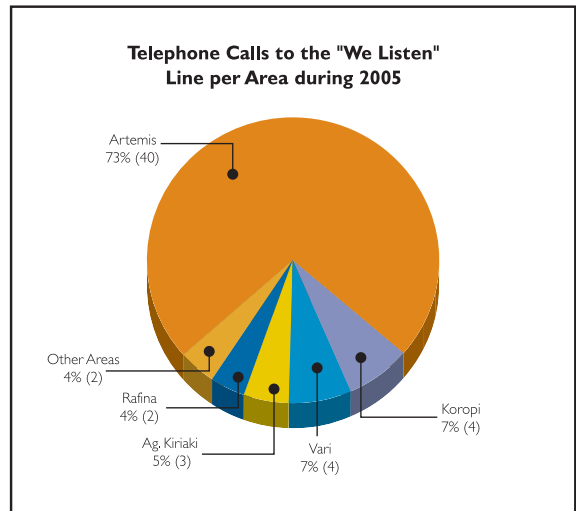


The data show that approximately 79% of aircraft movements realised are bound north on runways 03L and 03R, while 21% of the movements realised are bound south on runways 2IL and 2IR.

**Community Relations**

Athens International Airport has taken a number of initiatives in order to inform the local communities on noise issues. These include regular informative meetings with the local authorities and various representatives of local community organisations in the vicinity of the airport, as well as the creation of the “We Listen” call centre (210 35 30 003), through which citizens may receive information or discuss their concerns about noise issues on a 24hour basis.

During 2005, 55 complaints were received through this call centre, mainly from the Artemis area, and answered promptly.





# AIR QUALITY MANAGEMENT

In the context of air quality management, air quality on the airport site and the surrounding communities, as well as emissions from all relevant sources are monitored, while specific measures are adopted in order to reduce emissions wherever possible.

### Air Quality Monitoring

With respect to air quality and meteorology monitoring, Athens International Airport is one of the best equipped airports in the world. The equipment includes a six-station Air Quality Monitoring Network, an Acoustic Radar and a Differential Optical Absorption Spectroscopy system.

### Air Quality Monitoring Network

The Air Quality Monitoring Network (AQMN), consisting of five (5) permanent monitoring stations installed in the Municipalities of Glyka Nera, Koropi, Markopoulo, Pallini and Spata (see Map), and one (1) mobile station, has been operating since 1998 in order to assess the air quality in the wider Mesogeia area.



Ground level concentrations of the major pollutants, as well as basic meteorological parameters (wind speed and direction, temperature and relative humidity, precipitation, total solar radiation and atmospheric pressure) are measured in accordance to the reference methods of the European Union.

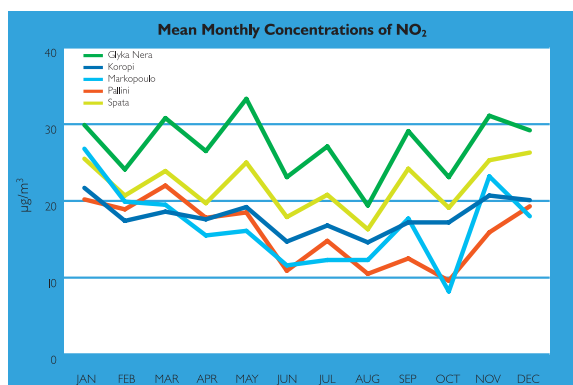
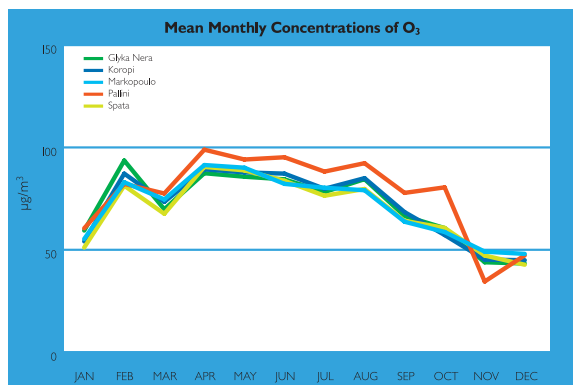
The results of the monitoring programme show that, in general, air quality in the Mesogeia area is satisfactory. It should be noted that the airport is just one of many sources

of air pollution within the Mesogeia region. Other sources include road traffic (Attiki Odos and other high-traffic roads) and the widespread development of the area (industry, construction of new roads, residential development etc).

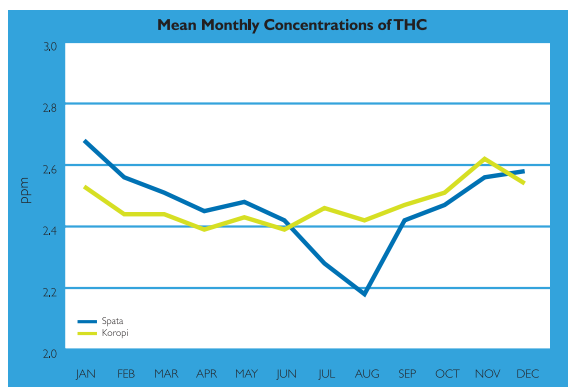
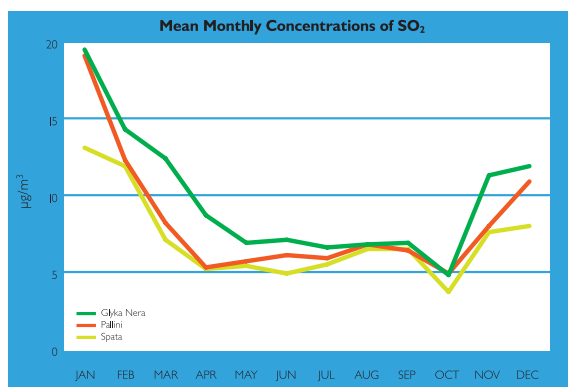
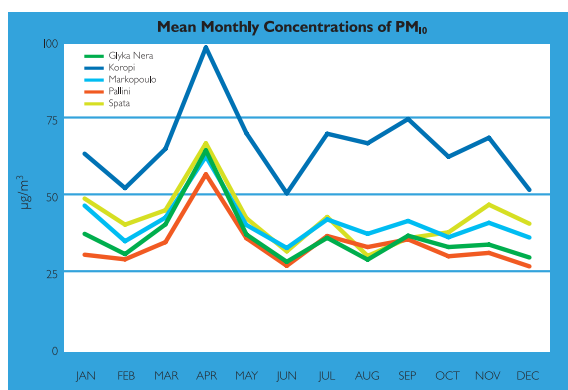
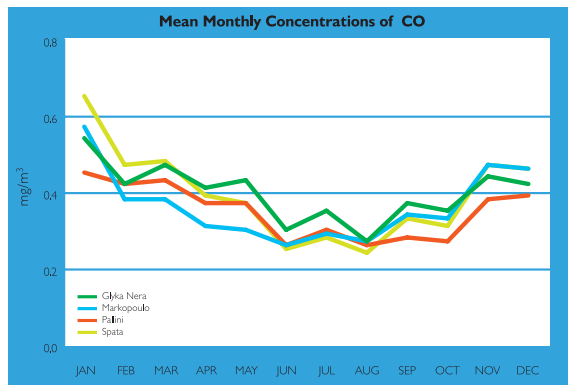
Mean Concentrations of Monitored Pollutants at the AQMN Stations						
Station	NO <sub>2</sub> μg/m <sup>3</sup>	O <sub>3</sub> μg/m <sup>3</sup>	PM <sub>10</sub> μg/m <sup>3</sup>	SO <sub>2</sub> μg/m <sup>3</sup>	CO mg/m <sup>3</sup>	THC ppm
Glyka Nera	27.2	71.5	37.2	9.9	0.4	-
Koropi	18.0	71.6	67.0	-	-	2.5
Markopoulo	16.8	71.3	42.0	-	0.4	-
Pallini	15.9	77.4	34.8	8.4	0.3	-
Spata	22.1	69.5	43.3	7.2	0.4	2.5

The mean pollutant concentrations for year 2005 are presented in the above table.

The following diagrams present the mean monthly concentrations of pollutants monitored at the AQMN stations.



The mean monthly concentrations of nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and carbon monoxide (CO) are very low. The mean monthly concentrations of ozone



(O<sub>3</sub>) gradually increase towards the spring and summer months, as increased temperatures and solar radiation promote the photochemical reactions that generate ozone.

In April 2005, the concentrations of particulate matter (PM<sub>10</sub>) were unusually high due to a Sahara dust incident. The concentrations of SO<sub>2</sub> and CO gradually decrease towards the spring and summer months, while no seasonal pattern is apparent in the concentrations of NO<sub>2</sub>, PM<sub>10</sub> and total hydrocarbons (THC).

**Acoustic Radar**

The Acoustic Radar, or SODAR, is installed in the airport's northeastern area (see Map) and has been providing data since November 2004. The system makes continuous, remote measurements of the three-dimensional wind profile as well as turbulence parameters in the lower atmosphere up to a maximum height of 1500 meters (depending on weather conditions).

Data from the SODAR shows that the wind speed increases with height, exhibiting a logarithmic profile. Near the surface, friction reduces wind speed, but as the height increases the surface effect is reduced and wind speed is increased.



**Differential Optical Absorption Spectroscopy System (DOAS)**

The Differential Optical Absorption Spectroscopy (DOAS) System is an advanced air quality monitoring system measuring gas concentrations as a function of light absorption.

The DOAS System has been installed at the threshold of the airport's western runway 03L (see Map), and thus contributes not only to the assessment of the air quality on the airport premises, but also to the monitoring of







aircraft emissions during takeoff. Data from DOAS are available from October 2005 onwards. Seven pollutants are measured: nitric oxide, nitrogen dioxide, ozone, sulphur dioxide, benzene, toluene and xylene, as well as the basic meteorological parameters (wind speed and direction, temperature and relative humidity).

The results of the analysis of the initial data collected with the DOAS system lead to the following conclusions:

- Nitric oxide, nitrogen dioxide, benzene and toluene are transported to the site from the W/WNW sector where the Attiki Odos is located, indicating the importance of motor vehicle emissions.
- The highest ozone concentrations are recorded with winds blowing from NE and SSW directions.
- With respect to the contribution of aircraft emissions from the runway and nearby taxiways, SO<sub>2</sub> levels appear to be the most affected.

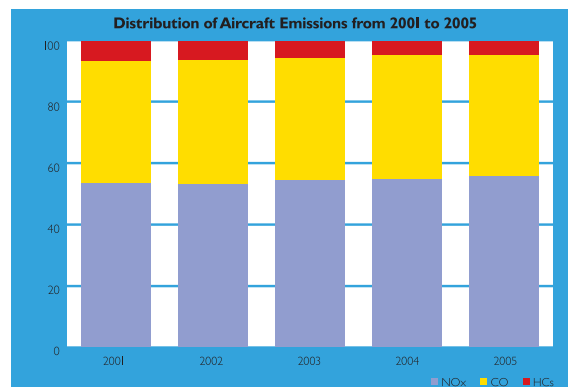
#### Aircraft Emissions Inventory

The Environmental Services Department has initiated a programme to estimate emissions of nitrogen oxides (NO<sub>x</sub>), hydrocarbons (HCs) and carbon monoxide (CO) from aircraft movements at the airport.

For this estimation, emissions during the Landing and Takeoff (LTO) cycle, comprising the approach and landing, taxi-in, taxi-out, takeoff and climbout phases are taken into account. The LTO cycle addresses emissions occurring up to a height of 1000 meters and some kilometres NE and SW along the airport's Landing/Takeoff axes. The guidelines issued by the International Civil Aviation Organisation (ICAO) were followed, and fuel consumption and pollutant emission factors from ICAO's public Aircraft Engine Emissions Databank were used for these

calculations. Emissions were calculated for 99% of the airport's total air traffic movements, including commercial, cargo and private aircraft as well as helicopters.

LTO cycle emissions were calculated for 2005 as well as retrospectively as far back as 2001, the airport's opening year.



The contribution of the particular pollutant emissions to total emissions from the LTO cycle is shown in the above diagram. There is an increasing trend of NO<sub>x</sub> and CO emissions in proportion to the air traffic increase. On the other hand, HC emissions have decreased as jet engine efficiency improves and older aircraft are withdrawn from the active fleet.

Additionally, the Environmental Services Department has initiated a programme to estimate emissions of the aforementioned pollutants from all other sources (e.g. burners) on the airport premises.

As previously mentioned, it should be noted that the airport is just one of many sources of air pollution within the Mesogeia area. Furthermore, air quality monitoring in the region has shown that most atmospheric pollutants exist at very low levels and, more specifically, are well below air quality thresholds set by both national and European legislation.

#### Emissions Reduction Measures

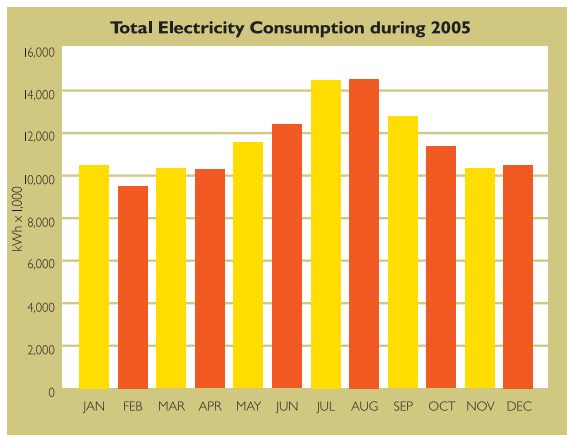
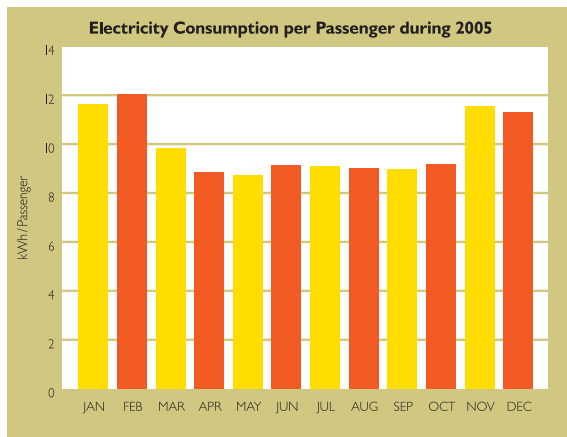
The measures adopted by the airport in order to reduce emissions, hence reducing their impact on local air quality, include: the use of environment friendly energy sources (e.g. natural gas, solar energy), the use of staff buses, the minimisation of the use of Auxiliary Power Units (APUs), encouragement of the use of public transportation for airport access (buses, metro, suburban railway), as well as the use of hybrid vehicles.

# ENERGY

Fossil energy production entails some negative environmental impacts, such as the emission of greenhouse gases (e.g. carbon dioxide) and other pollutant gases to the atmosphere. AIA closely monitors the consumption of electricity and fuel across the airport site in order to minimise these impacts.

## Electricity Consumption

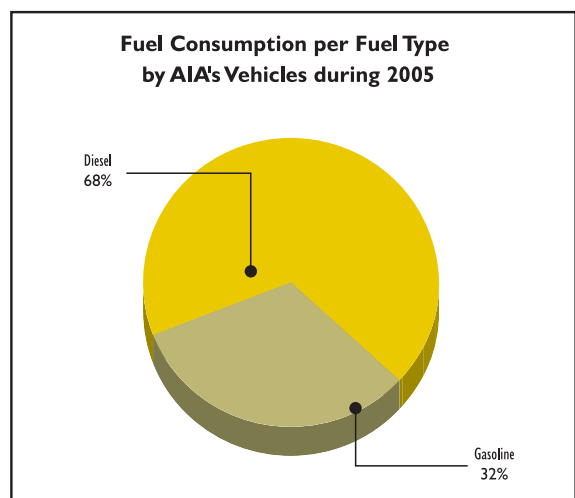
Electricity consumption data are collected monthly and correlated with the total number of passengers. Total electricity consumption peaks during the hot summer months (July and August) due to the increased use of air conditioning, while electricity consumption per passenger during the same period presents a minimum due to the increased number of passengers. Total electricity consumption during 2005 increased by approximately 3% compared to 2004, mainly due to the commercial expansion on the airport site.



## Fuel Consumption

### Gasoline & Diesel

Average fuel (gasoline and diesel) consumption per kilometre by the airport's fleet of vehicles is 0.19 l/km and does not exhibit any seasonal variation. In 2005, the airport replaced 10 of its petrol-powered vehicles with diesel-powered vehicles.



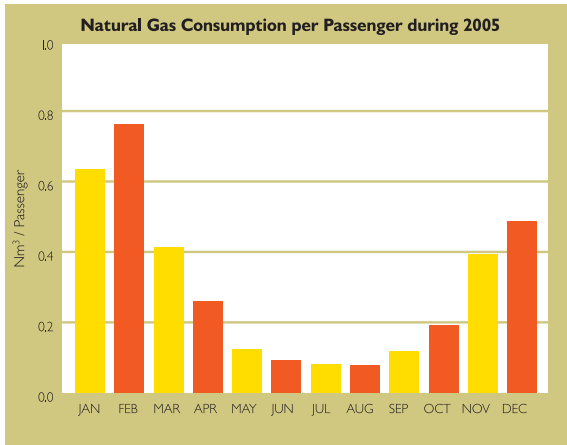
### Natural Gas

The airport uses environment friendly natural gas for heating and cooking purposes at various installations. Total natural gas consumption and consumption per passenger is high during the winter months due to increased heating needs.

During the summer, natural gas consumption per passenger reaches its minimum, due to both the increased number of passengers and the reduced needs for heating. During 2005 natural gas consumption increased by approximately 4% compared to the previous year.

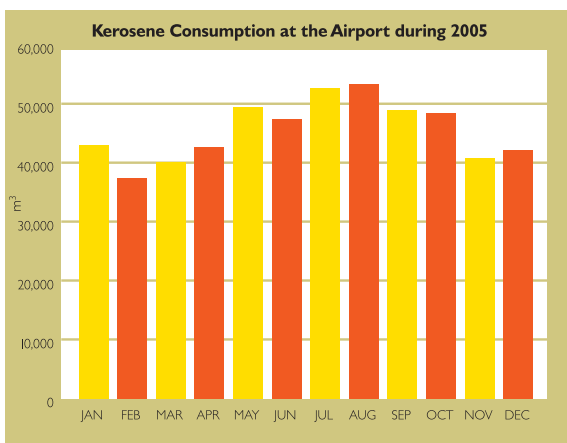
This increase can be attributed to both an increase in customers, and the expansion of commercial activities at the airport.





**Aviation Fuel**

Aviation fuel (kerosene) consumption peaks during the summer months when air traffic is at a maximum and declines during the less busy winter months. Aviation fuel consumption decreased by 5% from 2004 to 2005. The factors that influence aviation fuel consumption relate to changes in the active aircraft fleet, airline policies on refuelling etc, hence there is not a direct correlation between air traffic and fuel consumption.



**Energy and Water Management Committee**

The Energy and Water Management Committee, guided by the airport's corporate Energy and Water Policy, has taken a number of steps to minimise the airport's environmental impact, including optimisation of its current systems and the introduction of new energy-saving techniques and technology. In an effort to increase awareness, leaflets and posters were distributed to the entire Airport Community with practical advice regarding energy savings from office equipment (e.g. computers). Finally, at the end of 2005, the airport's Technical Services Department initiated an energy audit. The results of the audit, performed by external consultants, are expected by the end of 2006 along with specific proposals for further energy saving.



## WATER MANAGEMENT

Water management at Athens International Airport focuses on two sectors:

- Systematic monitoring of surface and ground water quality within and outside the airport area, as well as monitoring of the outflow of the Sewage Treatment Plants.
- Systematic monitoring of water consumption (potable and irrigation) on airport premises.

### Water Quality

#### Ground Water Quality Monitoring

Ground water monitoring wells are strategically installed across the airport site in order to monitor the water quality of overburden and bedrock aquifers. Ground water samples are collected on average every four (4) months from the seven (7) monitoring wells, and analysed by an independent laboratory. Additional monitoring wells are installed in areas where Third Parties operate, such as the fuel farm and the two gas stations. During 2005, the Environmental Services Department implemented a total of three ground water monitoring programmes in February, June and October. In some monitoring parameters exceedances were noted compared to the parameter values specified by the Common Ministerial Decision Y2/2600/2001 in reference to potable water quality. However, these exceedances had existed even before the airport's operation and are attributed to the natural background conditions and other human activities (e.g. agricultural) that are not related to the airport's operation.



#### Surface Water Quality Monitoring

For the surface water monitoring programme, water samples are collected at the airport site and analysed by an independent laboratory in regards to various parameters. During 2005, a total of thirteen (13) surface water quality programmes were conducted. Athens International Airport continues to implement initiatives to protect the quality of surface water, including:

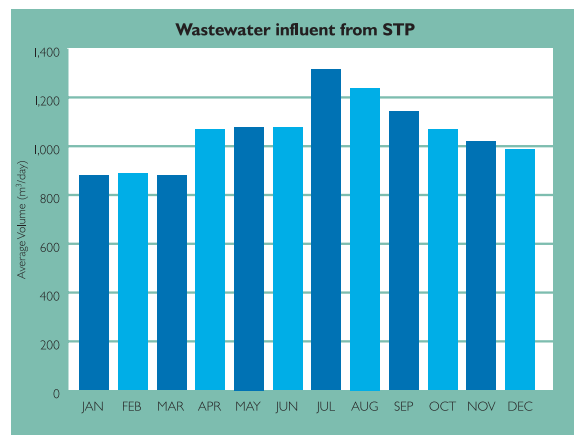
- Detailed environmental auditing in high-risk areas.
- Special training of Third Parties.
- Extensive sampling programmes.

#### Sewage Treatment Plants

Athens International Airport is one of the few airports in the world to have its own Sewage Treatment Plants (STP), which treat all sewage water generated across the airport site. The Main STP, which treats more than 99% of sewage, is located at the southeastern section of the airport site.

During 2005, the daily average sewage quantities treated in the STPs ranged from 881m<sup>3</sup> per day in January to 1,315m<sup>3</sup> per day in July.

After a thorough examination of the two STP operations by an independent consulting firm, AIA is currently constructing a denitrification and dephosphorisation unit in order to reduce the nitrogen and phosphorous values in the outflow of the STP. Construction works will be completed during 2006. At the same time, an Industrial Waste Treatment Facility is being constructed in the Olympic Airways technical base, and expected to be completed during 2006.

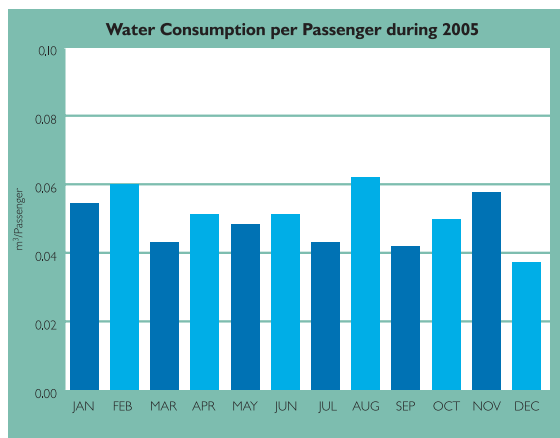
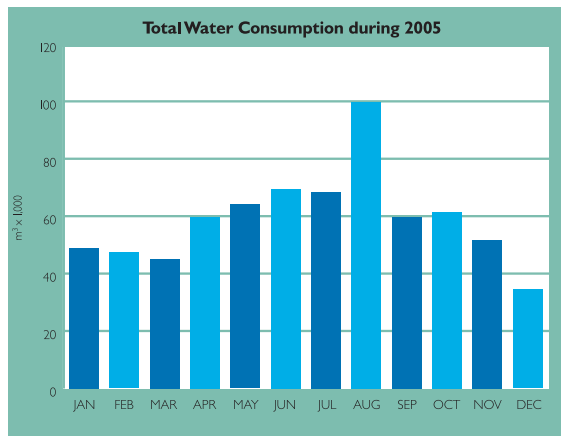





### Water Consumption

Water (potable and irrigation) consumption monitoring is performed with data provided by EYDAP (Public Water Authority). Total water consumption presents a peak during the summer (August), mainly due to the increased needs for irrigation. Water consumption per passenger is rather constant throughout the year. Total water consumption during 2005 presents a small increase compared to the previous year.

The Environmental Services Department participates in the Airport Company's Energy and Water Management Committee undertaking measures and initiatives according to the corporate Energy and Water Management Policy.





**ENERGY AND WATER CORPORATE POLICY**

Athens International Airport S.A. "Eleftherios Venizelos" (AIA), is committed to maximize efficiency in energy and water use and minimize the impacts on local and global air quality under the prism of sustainable development. To this effect, AIA implements an energy and water management policy, which, in consideration of technical, financial and environmental factors, aims to:

- Continuously evaluate and improve performance levels of energy and water consumption;
- Introduce programs to reduce energy and water consumption;
- Promote the use of novel energy and water efficient technology;
- Promote the use of renewable energy and cleaner fuels;
- Evaluate and introduce new methods of water recycling;
- Execute pilot projects for evaluation of new technologies for future airport wide implementation;
- Improve and update AIA's knowledge and awareness regarding new technologies
- Provide training to AIA and the wider airport community on energy and water management awareness;
- Improve design & construction criteria for all the airport community companies, with respect to energy and water management issues.


This Policy is in harmony with AIA 's Corporate Values and is available to all AIA employees and public through the company intranet/Internet.

The interdepartmental Energy & Water Committee will coordinate and monitor the implementation of this policy and report annually to AIA's executive management.

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Date: 15 November 2005

Signature

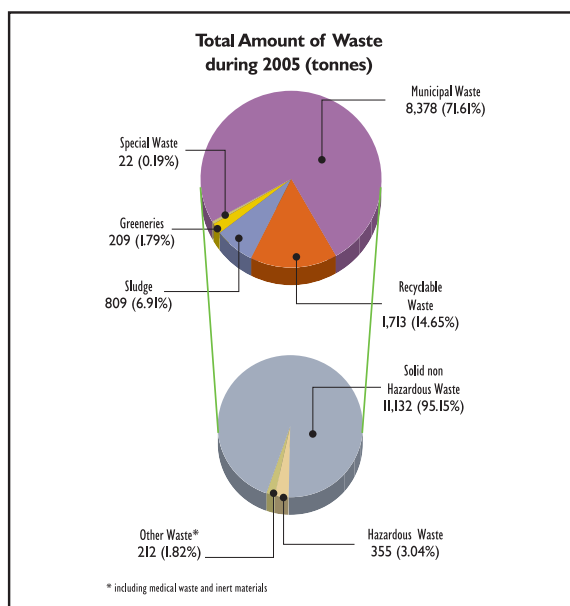


Alfred van der Meer  
CEO

## WASTE MANAGEMENT

Athens International Airport is responsible for waste management on the airport site and has developed a comprehensive waste management system based on "The Polluter Pays" principle. The major types of waste generated at "Eleftherios Venizelos" airport are:

- Solid Non Hazardous Waste.
- Hazardous Waste.
- Medical/Clinical Waste.
- Inert Materials.



During 2005, Athens International Airport generated in total 11,699 tonnes of waste, 11,132 tonnes of which were solid non hazardous waste, 355 tonnes hazardous waste, 212 tonnes inert material and 310 kg medical/clinical waste. The above chart presents the total amount of waste generated at the airport during 2005.

### Solid Non-hazardous Waste

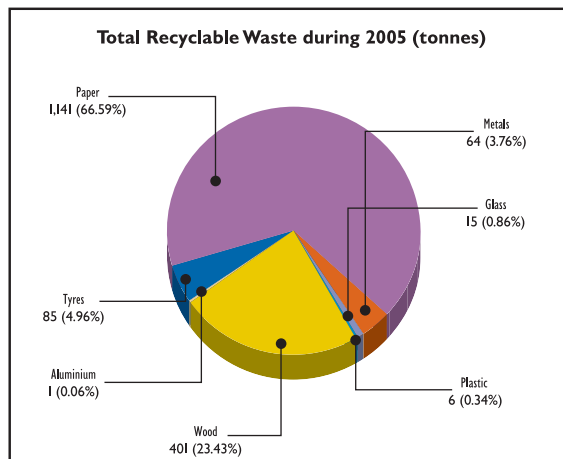
During 2005, the total quantity of municipal type of waste generated at the airport was 8,378 tonnes. The total amount of recyclable materials sent to recycling facilities for treatment was 1,713 tonnes, representing 15.4% of the total solid non-hazardous waste. Sludge from the Sewage Treatment Plants (STP) amounted to 809 tonnes, while 209 tonnes of greeneries and 22 tonnes of special waste were generated.

2005 has been a very successful year for the recycling programmes implemented at "Eleftherios Venizelos" Airport. The increased activities on airport premises, combined with the implementation of an economic incentive policy for the recycling of paper, plastic, glass, aluminium, metals, wood and used vehicle tyres, led to the increase of recyclable quantities from 1,504 in 2004 to 1,713 in 2005.



Additionally, a new recycling programme for aluminium cans in the offices of Athens International Airport and the personnel restaurants commenced.

The following chart presents the quantities of materials recycled during 2005.



### Hazardous Waste

Hazardous Waste Management represents a very important aspect of operations at the airport. The Environmental Services Department is constantly seeking solutions for the treatment, regeneration and/or recycling of hazardous





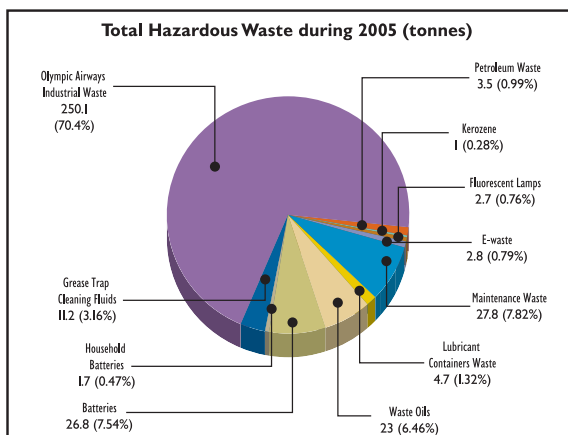
waste in authorised facilities according to the legislation in force, and has established co-operation with all Alternative Management Systems for hazardous waste.

Waste Type	Alternative Management System
Waste Oil	ELTEPE
Waste Packaging of Lubricants	KEDEP
Batteries (Pd-acid, Ni-Cd)	SYDESYS
Household Batteries	AFHS
E-Waste	AHHE

During 2005, a total of 355 tonnes of hazardous waste were produced and sent for final treatment/recycling.

Of the above, 23 tonnes of waste oils, 11.2 tonnes of oil and grease separator material, 1 tonne of kerosene (out of specifications) and 3.5 tonnes of waste petroleum products were sent to the National Collective Alternative Management System of Waste Oil (ELTEPE). Additionally, 26.8 tonnes of used batteries (Pb-acid, Ni-Cd) were sent to the National Alternative Management System of Accumulators (SYDESYS) and 1.7 tonnes of used household batteries were sent to the Collective Alternative Management System of Portable Primary Cells and Accumulators (AFHS).

A significant amount of e-waste (2.8 tonnes), as well as 2.7 tonnes of fluorescent lamps were sent for



recycling to the Collective Alternative Management System of Electrical and Electronic Equipment (AHHE). Olympic Airways generated 250.1 tonnes of industrial waste from non-destructive control, metal plating, and batteries and equipment cleaning workshops. These wastes were carried, under the supervision of the Environmental Services Department, to an authorised industrial waste treatment facility. Furthermore, 27.8 tonnes of maintenance waste were sent to the same facility.

Finally, in the context of AIA's co-operation with the Educational Programme for Recycling & Exchange (EPANA), 283 toners were collected, while a total of 338 Euros will be donated to public charity organisations.

In conclusion, 21% of the hazardous waste produced on airport site was sent for treatment/regeneration/recycling to the Alternative Management Systems.



### Medical/Clinical Waste

All medical/clinical waste is generated from the airport clinic, located at the emergency medical services (EKAV) building.

During 2005, 310 kg of medical/clinical waste (collected in special containers and stored in a specially designated area) were produced and sent for treatment to the special incineration unit operated by the Union of Municipalities and Communities of Attika (ESDKNA).

## NATURAL ENVIRONMENT

### Natural Ecosystems – Bio-monitoring Programme

The Environmental Services Department closely monitors the natural environment in the vicinity of the airport. Weather conditions during 2005 were relatively mild, thus the ecosystems in the vicinity of the airport had not suffered any damages during the winter and summer periods. During 2005 the biodiversity of avifauna species was at the same levels as in 2004.



The University of Patras is undertaking the first survey of the Bio-monitoring Phase II, comprising the following:

- Recording in a specific area of approximately 28,300 acres of the following:
  - Vertebrate species (Amphibians, Reptiles, Birds and Mammals).

- Plant species.
- Animal and Plant sociological patterns.
- Vegetation types.
- Habitats.
- Determination of possible qualitative and quantitative deviations from the baseline survey as well as assessment of overall natural environment conditions.
- Identification and assessment of the origin of such deviations and focus on those which may lead to environmental impacts.
- Re-assessment and finalisation of the Environmental Impact Indicators that will assist in monitoring impacts.
- Proposal for the establishment of monitoring zones and monitoring areas, and finalisation of the protocols required for the continuation of Bio-monitoring Programme.

The study commenced in November 2005 and will be completed in December 2007.

### Airport Landscaping

The airport's landscaping not only provides the proper operational conditions (e.g. soil stabilisation from jet blasts), but also blends the non-operational areas with the surrounding environment.



Due to the mild weather conditions in 2005, no significant damages were observed at the airport site. During 2005, the creation of a green zone of trees and shrubs along the airport's eastern perimeter was completed, and the







works for the extension of the irrigation system to the east and west perimeter green zone were finalised.

### **Bird Hazard Control and Reduction Programme**

Athens International Airport has established a bird hazard control and reduction programme in order to reduce the possibility of bird collision with aircraft.

This programme includes:

- Studies of bird species and their activities on airport site and adjacent areas.
- Design and implementation of long- and short-term measures and procedures to reduce bird strike hazards on airport premises and the vicinity, based on the risk assessment studies.
- Continuous monitoring of the proper implementation of the measures, evaluation of their effectiveness and audit for compliance with risk management requirements.



## SOCIAL INITIATIVES

### Construction Projects

As part of its commitment to contributing to the local communities' environment preservation, Athens International Airport is creating urban green areas at several Municipalities in the vicinity of the airport.

#### *Municipality of Koropi*

On 14 September 2005, the park area was handed over by the Municipality of Koropi to the Airport Company and the construction works began.

The 10,000m<sup>2</sup> area where the park is being constructed includes the old water reservoir building constructed in 1932.



The works include:

- Construction of an open-air theatre with a capacity of approximately 900 spectators.
- Construction of a kiosk with a surrounding open area.
- Improvement of the water reservoir building with cleaning, proper lighting and the construction of a surrounding paved area of approximately 1,500m<sup>2</sup>.

- Creation of stone-paved paths throughout the park.
- Creation of a fenced and properly planted playground.
- Planting of more than 600 trees and shrubs of the local flora, as well as ornamental plants.

The project will be completed on time due to the very efficient co-operation among the relevant departments of the Municipality of Koropi and Athens International Airport.

#### *Municipality of Artemis*

Athens International Airport, over and above its legal obligations, is funding the construction of a green area at the Municipality of Artemis. This project will strengthen the ties between the airport and the local community and will contribute to the improvement of environmental conditions in the area.

The technical department of the Municipality of Artemis has conducted a landscaping study for the "Municipality of Artemis Coastal Forest" situated along the major beach of Artemis and covering an area of 26,000m<sup>2</sup>.

The proposed works include:

- Repairs, restructuring and cleaning of the area.
- Installation of equipment: wooden benches, kiosks, playground equipment etc.
- Planting of 3,000 trees and shrubs of the local flora.
- Installation of an irrigation system.



Construction works are to be completed by early summer, so that the residents of Artemis may use the park during the high season.





### **Awareness Programme**

As part of the efforts to increase environmental awareness in the wider Mesogeia area, the Environmental Services Department, in co-operation with the Facility Services and the Business Control Department, organised the training seminar "The Airport and the Environment", addressing the students of the secondary education schools. The seminar features a presentation of the airport's environmental activities and a discussion with the students on general environmental issues, as well as issues related to the airport's operation.

During 2005, presentations have been given for the first-grade students of Markopoulo and Glyka Nera Lyceums, 1st and 2nd Rafina and 1st Koropi Technical Lyceums. In total, 344 students attended the seminar.

### **Recycling Programme for the Schools at the Municipality of Artemis**

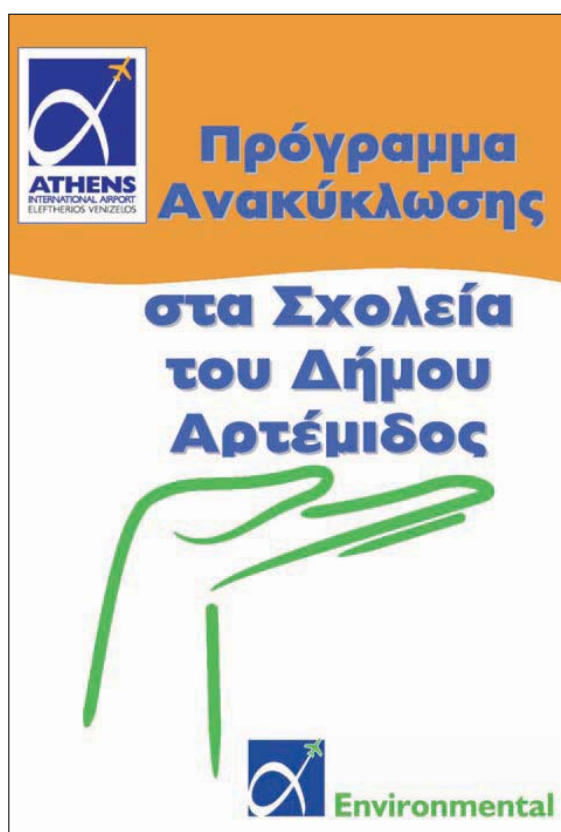
In its efforts to enhance environmental awareness and reduce waste generation, Athens International Airport launched in November 2005 a Recycling Programme for the schools at the Municipality of Artemis.

The programme includes paper and aluminium recycling at the Lyceum, High School, and the five Elementary Schools of the Municipality of Artemis, while the five Kindergartens of the area participate in paper recycling.



The Airport Company provides the schools with special containers for the collection of paper and aluminium, organises the transport and recycling of the collected materials, holds informative meetings with the students and distributes a special leaflet with information regarding the implementation of the programme.

In the course of 2006, the schools will be rewarded for their efforts according to the volume of recyclables collected. Besides the recyclables collected at school, students are encouraged to bring along to school materials collected at home. The programme develops with great success, thanks to the headmasters' and teachers' very positive response, the support of the Municipality of Artemis, and, above all, thanks to the children themselves, who have embraced this initiative with great enthusiasm.



### **Environmental Scholarship Programme**

As part of the efforts to increase environmental awareness and knowledge, Athens International Airport provides scholarships for environmental studies at the graduate level, in co-operation with the University of the Aegean, Department of Environmental Studies.



On 20 December 2005, at the graduation ceremony of the University of the Aegean, three postgraduate students received scholarship certificates.

The thesis subjects were:

- Geographic Information Systems (GIS) and Water Quality Data.
- Greenery Waste Management.
- Educational Presentation of the Environmental Activities of Athens International Airport.

**Aegean Airlines kindly supported the Environmental Scholarship Programme by providing complimentary tickets that allowed the scholarship recipients to travel to Athens for consultations.**



### **Meetings with Local Authorities**

The Environmental Services Department, in co-operation with the Facility Services and Business Control Department, has established procedures in order to inform the local communities on environmental and other issues related to the airport's operation.

During 2005, 50 informative meetings were held with the Mayors of the Municipalities in the vicinity of the airport, local Non-governmental Organisations and residents of the Municipalities of Artemis and Spata.





## OUR PARTNERS

### KLM Engineering & Maintenance



KLM Royal Dutch Airlines has chosen a proactive environmental strategy to fulfil its ambition to rank among the world's best airlines in terms of environmental performance. An environmental management system compliant with the international standard ISO 14001 is implemented in all activities in the Netherlands, as well as the worldwide flight operations. The proactive strategy involves the expansion of the environmental interest to KLM outstations.



KLM Royal Dutch Airlines has issued Good Environmental Practices (GEP) comprising general guidelines for the management and employees of KLM outstations for proper management of environmental issues. The continuous process of controlling the environmental impact and the avoidance of environmental damage is the starting point. If the environmental effects are unavoidable, adequate measures will be taken to reduce these effects.

Good Environmental Practices for aircraft maintenance include among others the following:

- Prevention of soil, ground, water and air pollution with: proper storage of hazardous materials; performing all potentially soil-polluting activities on a watertight surface, resistant to the fluids used; and prohibiting fluid discharge in sewage systems or directly into surface water.

- In case of leakage, specific measures are taken, such as containers placed in order to avoid leaking fluids streaming toward sewage drains; absorbing the fluids with absorption materials; and disposing the waste according to the local rules and regulations.

Furthermore, an effective supervision of the local line management is needed to establish permanent environmental awareness. Finally, active internal communication, training through AIA's Environmental Services Department and audits contribute to the continuous improvement of good environmental practices at the KLM outstations.

## SAFCO S.A.



SAFCO (Spata Airport Fuelling Company) is a consortium created by BP Hellas (25%), EKO (25%), MOBIL Oil Hellas (25%) and Shell Hellas (25%). At the moment, SAFCO's fleet consists of 12 Dispencers and three (3) Refuellers with total fuel capacity of approximately 110m<sup>3</sup>. In addition, SAFCO provides handling for AVGAS 100LL, Aviation lubricants and Consulting on Aviation issues, such as airport fixed installations, fuelling procedures, aviation manuals etc.

SAFCO S.A. operates in accordance to JIG (Joint Inspection Group) guidelines, and uses the state-of-the-art Fuel Handling System (FHS), a fully automatic and radio linked dispatching system, directly interfaced to AIA's Flight Information Data System (F.I.D.S.).

SAFCO S.A. has adopted a systematic approach to environmental management, designed to ensure compliance with the law and achieve continuous performance improvement.



SAFCO S.A. is committed to protecting the environment; using materials and energy efficiently to provide its products and services; playing a leading role in promoting best industry practices; and promoting a corporate culture whereby all SAFCO employees share this commitment. In this way, it aims at an HSE performance it can be proud of; earning the confidence of customers

and society at large; being a good neighbour; and contributing to sustainable development.

SAFCO's policy regarding hazardous waste both in the aviation facilities and in other installations is:

- To minimise waste generation.
- To perform suitable identification, classification and separation of waste.
- To ensure safe transportation and disposal of waste.

Hazardous waste and other used materials are handled as follows:

- **Tank Drain Materials:** Stored in special containers with proper signage whence they are sent for treatment.
- **Used Vehicle Oils and Lubricants, Fuel and Vehicle Filters:** Collected in special metal containers (I.B.C.) stored in the maintenance area whence they are sent for recycling.
- **Vehicle Batteries, Vehicle Tyres - Hoses:** Collected separately and sent for recycling.
- **Paper:** Collected in special paper recycling containers and sent for recycling.





## THE ENVIRONMENTAL SERVICES DEPARTMENT

The Environmental Services Department, which is part of the Corporate Services Unit, was established from the first day of the Airport Company's operation in June 1996. The Department is currently employing sixteen qualified scientists and experts in various environmental fields, and administrative personnel.

### The Environmental Services Department Personnel

**Mr Anastasios Anagnostopoulos**

*Supervisor – Wildlife & Landscaping*

**Mrs Evi Anamaterou**

*Air Quality & MET Analyst*

**Mr Michael O'Connor**

*Air Quality & MET Coordinator*

**Mr Nikolaos Fokas**

*Wildlife Specialist – External Associate*

**Mrs Sabine Kablitz**

*Waste Management Coordinator*

**Dr Panagiotis Karamanos**

*Manager of the Environmental Services Department*

**Dr Charalampos Kavouras**

*Supervisor – Water, Waste & EMS*

**Ms Ifigenia Kokkiniotou**

*Waste Management Analyst – External Associate*

**Mr Aristidis Konstandinidis**

*Environmental Analyst*

**Mr Evangelos Livaditis**

*Environmental Monitoring Systems Technician*

**Mr Dionysis Ntampakis**

*Wildlife Specialist*

**Mrs Faidra Paspaliari**

*Administrative Assistant*

**Mrs Clary Raftopoulou**

*EMS, Water and Hazardous Waste Coordinator*

**Mrs Marina Sarkissian**

*Supervisor – Noise & Air Quality*

**Ms Calypso Vlachou**

*Environmental Coordinator*

**Mr Giannis Vlatsiotis**

*Wildlife Specialist – External Associate*

### Special Events

As part of the efforts to inform the public and increase environmental awareness, the Environmental Services Department:

- Continued to successfully operate the Museum and the Environmental Information Centre, which was updated. During 2005, 2,989 people visited the Environmental Information Centre by means of a site tour provided by the Visitors Service Team.
- Successfully organised a contest among company employees regarding the Airport Company's environmental activities.
- Made a number of presentations at domestic and international meetings or conferences on various issues including air quality, bird control, spill response, and environmental management.



